

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
11 August 2005 (11.08.2005)

PCT

(10) International Publication Number
WO 2005/074287 A1

(51) International Patent Classification⁷: H04N 7/18, G06T 1/00, B60R 1/00, 21/00

(74) Agents: SOGA, Michiteru et al.; S. Soga & Co., 8th Floor, Kokusai Building, 1-1, Marunouchi 3-chome, Chiyoda-ku, Aichi 1000005 (JP).

(21) International Application Number:

PCT/JP2004/016454

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 29 October 2004 (29.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-023673 30 January 2004 (30.01.2004) JP

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

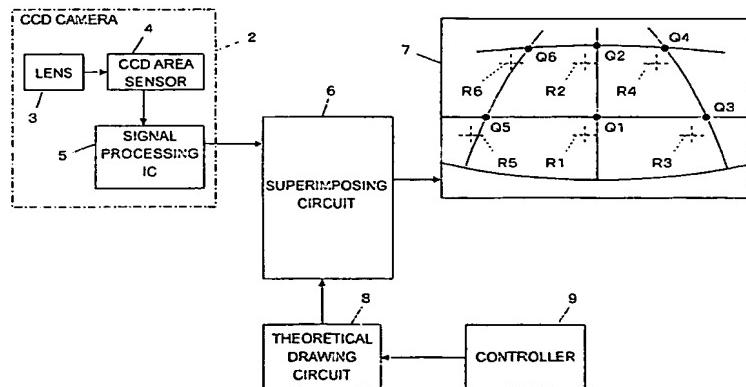
(71) Applicant (for all designated States except US): KABUSHIKI KAISHA TOYOTA JIDOSHOKKI [JP/JP]; 2-1, Toyoda-cho, Kariya-shi, Aichi 4488671 (JP).

Published:

— with international search report

[Continued on next page]

(54) Title: VIDEO IMAGE POSITIONAL RELATIONSHIP CORRECTION APPARATUS, STEERING ASSIST APPARATUS HAVING THE VIDEO IMAGE POSITIONAL RELATIONSHIP CORRECTION APPARATUS AND VIDEO IMAGE POSITIONAL RELATIONSHIP CORRECTION METHOD



(57) Abstract: A video image positional relationship correction apparatus is disclosed. Coordinate conversion parameters including internal parameters of a camera and attachment parameters are used as unknown numbers. Relational expressions are produced such that the number of the relational expressions is larger than the number of the coordinate conversion parameters to be calculated. Values of the coordinate conversion parameters are calculated based on deviations between monitor coordinates of video image reference points Q1 to Q6 actually captured by the camera and displayed, and the corresponding monitor coordinates of virtual target points R1 to R6. The monitor coordinates of the virtual target points are derived from the actual coordinates of the reference points based on the values of the calculated coordinate conversion parameters. The coordinate conversion parameters are determined such that the square-sum of the deviations between the monitor coordinates of the virtual target points and the monitor coordinates of the actually captured video image reference points is the minimum. Based on the determined values of the coordinate conversion parameters, the relative positional relationship between the actual video image and the virtual video image is corrected.

WO 2005/074287 A1